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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/910,886	07/24/2001	Miki Ogawa	35.C15586	3334

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NEW YORK, NY 10112

EXAMINER

BAREFORD, KATHERINE A

ART UNIT	PAPER NUMBER
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1762

8

DATE MAILED: 04/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/910,886

Applicant(s)

OGAWA, MIKI

Examiner

Katherine A. Bareford

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 4-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers** Claim 3 is canceled.

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### DETAILED ACTION

1. The amendment of March 11, 2003 has been received and entered.

#### *Claim Objections*

2. The objection to claims 9-11 and 17-19 to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from another multiple dependent claim is withdrawn due to applicant's amendments to the claims.

#### *Double Patenting*

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

- 1-2, 4-8
4. Claims ~~1-8~~<sup>1-2, 4-8</sup>, 12-16 and 20-24 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 24-47 and 53-54 of copending Application No. 09/478,884. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of 09/478,884 provide the

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suggestion of the features of these present claims of providing a solution of silicon alkoxide and surfactant in contact with a substrate of alignment control ability and drying the substrate to remove the surfactant and solvent so as to provide an aligned porous material.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

105 5. <sup>1-2, 4-8</sup> Claims ~~1-8~~, 12-16 and 20-24 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-22 of copending Application No. 09/657,616. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of 09/657,616 provide the suggestion of the features of these present claims of providing a solution of silicon alkoxide and surfactant in contact with a substrate of alignment control ability and drying the substrate to remove the surfactant and solvent so as to provide an aligned porous material.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. In the amendment of March 11, 2003, applicant stated that the above rejections are provisional rejections which may never mature into actual rejections depending on the prosecution in all cases, and that applicant will consider a terminal disclaimer at the appropriate time. The Examiner has reviewed this statement, and continues to maintain the provisional rejections above.

*Claim Rejections - 35 USC § 112*

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. The rejection of claims 1-8, 12-16 and 20-22 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention are withdrawn due to applicant's amendments to the claims.

Claim 1, line 5, as to "alignment control ability" the Examiner notes the clarification of the claim.

Claim 1, lines 6-8, the Examiner notes the amendment of the claim to provide contact of the solution with the substrate.

Claim 4, lines 3-4, as to "alignment control ability" the Examiner notes the clarification of the claim.

Claim 4, line 6, the Examiner notes the clarification to "drying said coated substrate"

Claim 5, lines 4, 6-7, and 7-8, the Examiner notes the rewording of the claim.

Claim 12, lines 3-4, as to "alignment control ability" the Examiner notes the clarification of the claim.

Claim 12, line 6, the Examiner notes the clarification to "drying said substrate".

Claim 12, line 7, the Examiner notes the clarification of when "removing the surfactant" occurs in the process.

Claim 13, line 4, the Examiner notes the clarification of the term "portion".

Claim 13, line 5, the Examiner notes the rewording of the phrase "in a desired shape".

Claim 20, lines 4-5, as to "alignment control ability" the Examiner notes the clarification of the claim.

*Claim Rejections - 35 USC § 102*

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(f) he did not himself invent the subject matter sought to be patented.

10. <sup>1-2, 4-8,</sup>  
Claims ~~1-8~~, 12-16 and 20-22 are rejected under 35 U.S.C. 102(f) because the applicant did not invent the claimed subject matter

As discussed in the provisional obvious double patenting rejections above, the claims of 09/478,884 and 09/657,616 suggest all the features of these claims. Furthermore, these co-pending applications have different inventors than the present application.

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In the amendment of March 11, 2003, applicant argues that the rejection under 35 USC 102(f) is not in order since the applications in issue are owned by the same assignee. However, under 35 USC 102(f) the showing required is that the applications in issue were commonly owned at the time <sup>of</sup> ~~or~~ applicant's invention (or to name the first inventor). See MPEP 804.

Therefore, the rejection is maintained.

11. Claims 1, 2, 4, 11 (depending from claim 4), 12, 19 (depending from claim 12) and 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Bruinsma et al (US 5922299).

Bruinsma teaches a method of manufacturing material. Column 1, lines 10-20. A solution is provided that contains a solvent (water), silicon and a surfactant. Column 6, lines 55-65, column 7, lines 20-55 and column 8, lines 50-55. The solution is contacted with a substrate. Column 8, lines 10-25 and 55-65. The coated substrate is dried to remove the solvent contained in the solution and to form a porous material. Column 8, lines 15-20. The porous material has a uniaxially aligned channel structure in which the surfactant is held within the porous material. Column 2, lines 15-25 and column 9, lines 5-25 (the later calcining burns out the surfactant). As a result, it is shown that the substrate is one that provides a controlled alignment of an opposing surface of an overcoated layer thereon.

Claim 2: the silicon is contained in the solution in the state of compound. Column 7, lines 20-40.

Claim 4: Bruinsma teaches a method of manufacturing material. Column 1, lines 10-20. A solution is provided that contains a solvent (water), silicon alkoxide and a surfactant.

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Column 6, lines 55-65, column 7, lines 20-55 and column 8, lines 50-55. The solution is contacted with a substrate. Column 8, lines 10-25 and 55-65. The coated substrate is dried to remove the solvent contained in the solution and to form a porous material. Column 8, lines 15-20. The porous material has a uniaxially aligned channel structure in which the surfactant is held within the porous material. Column 2, lines 15-25 and column 9, lines 5-25 (the later calcining burns out the surfactant). As a result, it is shown that the substrate is one that provides a controlled alignment of an opposing surface of an overcoated layer thereon.

Claim 12: Bruinsma teaches a method of manufacturing material. Column 1, lines 10-20. A solution is provided that contains a solvent (water), silicon alkoxides and a surfactant. Column 6, lines 55-65, column 7, lines 20-55 and column 8, lines 50-55. The solution is contacted with a substrate. Column 8, lines 10-25 and 55-65. The coated substrate is dried to remove the solvent contained in the solution and to form a porous material. Column 8, lines 15-20. The porous material has a uniaxially aligned channel structure in which the surfactant is held within the porous material. Column 2, lines 15-25 and column 9, lines 5-25 (the later calcining burns out the surfactant). As a result, it is shown that the substrate is one that provides a controlled alignment of an opposing surface of an overcoated layer thereon. After the forming of the porous material the surfactant is removed by calcining. Column 9, lines 5-25.

100 <sup>Hand</sup> Claim 19: the substrate can be coated with the solution by a dip coating method. Column 8, lines 15-20.

Claim 20: Bruinsma teaches a method of manufacturing material. Column 1, lines 10-20. A solution is provided that contains a solvent (water), silicon and a surfactant. Column 6,

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lines 55-65, column 7, lines 20-55 and column 8, lines 50-55. The solution is attached to a substrate. Column 8, lines 10-25 and 55-65. The coated substrate is dried to remove the solvent contained in the solution and to form a porous material. Column 8, lines 15-20. The porous material has a uniaxially aligned channel structure in which the surfactant is held within the porous material. Column 2, lines 15-25 and column 9, lines 5-25 (the later calcining burns out the surfactant). As a result, it is shown that the substrate is one that provides a controlled alignment of an opposing surface of an overcoated layer thereon.

Claim 21: silicon is contained in the solution in the form of compound. Column 7, lines 20-40.

Claim 22: the silicon is contained in the solution as silicon alkoxides. Column 7, lines 20-40.

Claim 23: Bruinsma teaches a method of manufacturing material. Column 1, lines 10-20. A solution is provided that contains a solvent (water), silicon and a surfactant. Column 6, lines 55-65, column 7, lines 20-55 and column 8, lines 50-55. The solution is contacted with a substrate. Column 8, lines 10-25 and 55-65. The coated substrate is dried to remove the solvent contained in the solution and to form a porous material. Column 8, lines 15-20. The porous material has a uniaxially aligned channel structure in which the surfactant is held within the porous material. Column 2, lines 15-25 and column 9, lines 5-25 (the later calcining burns out the surfactant).

Claim 24: after the porous material is formed, the surfactant is removed. Column 9, lines 5-25.

12. The rejection of claims 1-5, 7, 12-13, 15 and 20-22 under 35 U.S.C. 102(b) as being anticipated by Miyata, et al "Alignment of Mesoporous Silica on a Glass Substrate by a Rubbing Method" (hereinafter "Miyata") is withdrawn due to the amendments to the claims.

13. The rejection of claims 1-5, 7-8, 12-13, 15-16 and 20-22 under 35 U.S.C. 102(a) as being anticipated by Japan 2001-058812 (hereinafter '812) is withdrawn due to the amendments to the claims.

14. The rejection of claims 1-6, 12-13, 14 and 20-22 under 35 U.S.C. 102(a) as being anticipated by Japan 2000-233995 (hereinafter '995) is withdrawn due to the amendments to the claims.

*Claim Rejections - 35 USC § 103*

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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16. Claims 5, 9-10, 11 (as depending from claim 5), 13, 17-18 and 19 (as depending from claim 13) are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruinsma et al (US 5922299).

As discussed in the 35 USC 102(b) rejection above, Bruinsma teaches all the features of these claims except (1) the patterned application, (2) the pen lithography application and (3) the ink jet application method.

However, while Bruinsma teaches a spin coating application method, Bruinsma also teaches that films may also be deposited by spraying, painting or dip coating. See column 8, lines 10-25. The key issue is to provide a coating that has a high surface area to volume ratio. See column 6, lines 55-68 and column 4, lines 15-25.

It is the Examiner's position that pen lithography and ink jet application are well known application methods for applying thin lines of liquid on a substrate. The Examiner notes that ink jet application is a form of atomizing and spraying a liquid. If applicant disagrees, he should so state.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bruinsma to provide a patterned coating on the substrate by a method such as pen lithography or ink jet coating with an expectation of achieving a desired coating, because Bruinsma teaches that a variety of methods can be used to deposit the coating, as long as it has a high surface to volume ratio including spraying, painting or dip coating, and it is the Examiner's position that pen lithography and ink jet applications would be well known methods that fall within the suggested methods, since pen lithography provides the drawing of thin lines that would

fall within the teaching of painting and ink jet is a well known form of droplet spraying. The teaching of methods such as painting would provide a clear suggestion of providing a patterned coating as desired, since the application of a material by painting would be conventionally understood to require a controlled placement of coating at individual portions of the substrate.

17. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruinsma as applied to claims 1, 2, 4, 11 (depending on claim 4), 12, 19 (depending on claim 12) and 20-24 and also to claims 5, 9-10, 11 (depending on claim 5), 13, 17-18 and 19 (depending on claim 13) above, and further in view of Miyata, et al "Alignment of Mesoporous Silica on a Glass Substrate by a Rubbing Method" (hereinafter "Miyata").

Bruinsma teaches all the features of these claims except the substrate that is precoated with a polymer compound film subjected to a rubbing process.

Miyata teaches a method of preparing a porous material, a mesoporous silica. See page 1609, abstract. A substrate is provided. See page 1610, "Experimental Section". The substrate is provided with a polyimide film that is treated by rubbing (to give alignment control). See page 1610, "Experimental Section" and the first column. A solution is provided. See page 1610, "Experimental Section". The solution contains silicon alkoxide and a surfactant. See page 1610, "Experimental Section". The solution is placed in contact with the substrate. See page 1610, "Experimental Section". Then after contact, the substrate is dried to remove the solvents contained in the solution. See page 1610, "Experimental Section". The substrate is

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also calcined, which removes the surfactant. See page 1610, "Experimental Section". This provides a coating with an aligned structure. See page 1610.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bruinsma to use a substrate provided with a precoating of a rubbed polymer film as suggested by Miyata to provide a desired alignment of the coating, because Bruinsma teaches the desire to provide an aligned mesoporous silica film, and Miyata teaches a desirable substrate to provide such alignment when making aligned mesoporous films.

18. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruinsma as applied to claims 1, 2, 4, 11 (depending on claim 4), 12, 19 (depending on claim 12) and 20-24 and also to claims 5, 9-10, 11 (depending on claim 5), 13, 17-18 and 19 (depending on claim 13) above, and further in view of MacDougall et al (US 6365266).

Bruinsma teaches all the features of these claims except that the substrate is a silicon single crystal substrate with 110 orientation. Bruinsma does teach that the substrate can be a silicon wafer. See column 8, lines 40-50.

MacDougall teaches applying a coating to a substrate. Column 1, lines 15-20. The coating is in the form of a solution with a silicon alkoxide and a surfactant that is applied to the substrate. See column 2, lines 55-65 and column 3, lines 10-68. The applied coating is calcined to form a mesoporous silica film. See column 6, lines 5-20 and column 1, lines 15-20. The substrate used can be a single crystal silicon wafer. See column 5, lines 5-20.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bruinsma to apply the coating to a substrate of a single crystal silicon wafer as suggested by MacDougall with an expectation of forming a desirable coated wafer, because Bruinsma teaches a desirable process of forming a coating using a solution with a silicon alkoxide and a surfactant applied to the surface and MacDougall teaches that a desirable surface for forming a coating using a solution with a silicon alkoxide and a surfactant applied to the surface is a silicon single crystal wafer. As to the orientation of the single crystal silicon, MacDougall provides no limitation as to the orientation, and thus, one of ordinary skill in the art would expect desirable results from the various possible orientations, noting that Bruinsma provides the aligned film.

19. Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruinsma in view of Miyata as applied to claims 7 and 15 above, and further in view of Fuchs et al (US 5246784).

Bruinsma in view of Miyata teaches all the features of these claims except that the substrate is coated with a Langmuir-Blodgett film of polymer compound. Miyata does teach that the substrate is coated with a polyimide film. See page 1610, "Experimental Section". It is desirable for the film to be in the nanometer range. See page 1610, "Experimental Section".

Fuchs teaches applying a coating to a substrate. Column 1, lines 5-20. The coating is a polyimide that is applied to the substrate. See column 1, lines 5-20. The applied coating is applied by a Langmuir-Blodgett technique to form a thin coating, thinner than by a normal spin

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coating. See column 1, lines 5-30 and column 2, lines 5-65. The coating can be 0.3 to 500 nm. See column 2, lines 60-65. The substrate used can be a silicon wafer. See column 2, lines 35-40.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bruinsma in view of Miyata to apply the polyimide coating to the substrate by the Langmuir-Blodgett method as suggested by Fuchs with an expectation of forming a desirable coated wafer, because Bruinsma in view of Miyata teaches a desirable process of forming an aligned coating using preliminary coating of a polyimide applied to the surface and Fuchs teaches that a desirable method for forming a nanometer thick polyimide coating is by the Langmuir-Blodgett process.

#### *Response to Arguments*

20. Applicant's arguments with respect to claims 1-2 and 4-24 have been considered but are moot in view of the new ground(s) of rejection.

In view of applicant's amendments to the claims, a new primary reference, to Bruinsma et al, has been provided to provide a coating that forms an ordered mesoporous material by the evaporation/drying of the solvent from the solution, such that the process can take less than 10 seconds. See column 4, lines 1-15 and column 3, lines 35-55.

#### *Conclusion*

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21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).


Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (703) 308-0078. The examiner can normally be reached on M-F(7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

  
KATHERINE A. BAREFORD  
PRIMARY EXAMINER  
GROUP 1100 / 700